

# Ananthu Rajendran Pillai

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## SKILLS

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**Programming Languages:** Python, C++, SQL, MATLAB

**Framework & Libraries:** Numpy, Pandas, Matplotlib, Scikit-learn, PyTorch, Hugging Face Transformers, LangChain

**Tools & Technologies:** Git, Linux, LaTeX, MySQL, FAISS, Streamlit, DVC, AWS (beginner), MLflow (beginner), DVC, PTC Creo

## EXPERIENCE

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**Research Intern**, Energy Research Institute @ NTU (ERI@N) – Singapore

Mar 2024 – Dec 2024

- Enhanced an Model Predictive Control system using LSTM network for building HVAC management, driving 25–40% energy-use reduction.
- Integrated machine learning based MPC algorithms into a BACnet-based BMS in collaboration with Ngee Ann Polytechnic, leveraging MySQL for scalable deployment.
- Leveraged technologies including Linux, MySQL and PyTorch scalability and performance.

**Electromechanical Design Engineer**, Schneider Electric – Coimbatore, India

July 2022 – Aug 2023

- Spearheaded R&D optimization for the TFTQ low-voltage switchboard line, delivering a closed-door operation (CDO+) feature that boosted orders by 20% and met IEC 61439 standards.
- Integrated temperature & humidity sensors for real-time thermal monitoring, improving reliability and enabling preventive maintenance workflows.
- Tools leveraged: PTC Creo Parametric, MS Excel, MS PowerPoint

## EDUCATION

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**Nanyang Technological University**, MSc. in Computer Control & Automation – Singapore

Jan 2024 – present

CGPA: 4.42/5.0

- Relevant Coursework: Genetic Algorithms & Machine Learning, AI & Data Mining, Neural Networks & Deep Learning, Machine Vision, Natural Language Processing, Robotics & Intelligent Sensors.

**College of Engineering, Trivandrum**, B.Tech. in Electrical & Electronics Engineering – India

Aug 2018 – July 2022

CGPA: 9.71/10.0

- Relevant Coursework: Linear Algebra, Probability & Statistics, Calculus, Signals & Systems, Digital Electronics.

## PROJECTS

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### ML-Based Semantic Description for Smart Buildings

Python · Ultralytics YOLOv8 · Mistral-7B · Gemini 2 · FAISS · RAG · JSON · Brick Schema

- Built a multi-stage pipeline to convert service-drawing PDFs/images into Brick Schema.
- Detected components YOLOv8, build relationship among components using heuristics & LLM prompting to output JSON graph.
- Employed an RAG-enhanced LLM (with Brick ontology docs) to generate the final Brick Schema file.
- Evaluated against manually curated schemas:
  - Avg F1 (classes): 93.85%   • Avg F1 (edges): 80.69%.

### Resume Job Description Matcher

Python · Streamlit · Hugging Face Transformers · PyTorch

- Deployed a Streamlit app which classifies resumes into 24 job categories, matches resumes to job descriptions as No Fit / Potential Fit / Good Fit, parses skills via spaCy NER to highlight gaps & recommend keywords.
- Fine-tuned BERT (Hugging Face) on matching and NER tasks, achieving robust precision/recall.

### Human Action Recognition in Low-Light Conditions

Python · NumPy · scikit-learn · PyTorch (ViT)

- Designed a video-classification pipeline for 2–3 s clips under poor illumination: frame sampling → feature extraction → normalization → classification (Gaussian NB, Logistic Regression).
- Prototyped Vision Transformer models in PyTorch to push accuracy beyond traditional ML baselines.

## CERTIFICATIONS & EXTRACURRICULARS

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- Programming for Everybody in Python, Coursera.
- Supervised Machine Learning: Regression and Classification, Coursera.
- NTU GSA Administration Subcommittee Member (organized volunteering & team-building).
- National Service Scheme Volunteer (240 hours community service).